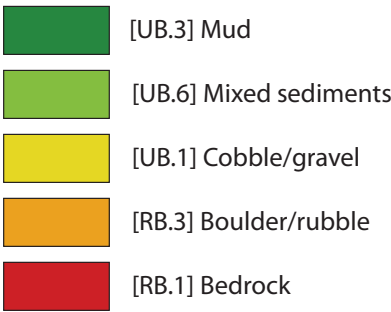


CMECS SUBCLASS LEVEL SUBSTRATES



This seafloor character map was produced using (1) a supervised classification of multibeam backscatter (intensity) that is divided into two classes of induration (hard and soft bottom) and (2) manual polygon selection using geological reasoning, seafloor property measurements from the multibeam bathymetry, and knowledge of substrate types from video observations, seismic reflection profile interpretations, and sediment sampling. The seafloor properties examined during manual classification were rugosity (a derivative for seafloor roughness) and seafloor slope. These were used to help identify steeply sloping and rugose areas that are most likely bedrock or consolidated glacial material.

The Coastal and Marine Ecological Classification Standard (CMECS) (v. III June 2008 draft) by the National Oceanic and Atmospheric Administration (NOAA) and NatureServe was used to classify various substrate types (Madden and others, 2008). Units displayed on this map represent the Benthic Cover Component subclass level of the CMECS classification draped over the shaded bathymetry shown on sheet 1. Substrate distributions are summarized for the entire fjord in the tables below. Table 1 shows the percent and area of the substrate distribution by CMECS class. The unconsolidated bottom [UB] CMECS class is divided into mud [UB.3], mixed sediments [UB.6], and cobble/gravel [UB.1] subclasses. The rock bottom [RB] CMECS class is divided into bedrock [RB.1] and boulder/rubble [RB.3]. Bathymetric contours represent the division between benthic depth zones defined by the CMECS classes. Table 2 shows the percent and area of each benthic depth zone. The zones depicted in this map are deep infralittoral (5–30 m), circallittoral (30–80 m), circallittoral (offshore) (80–200 m), and mesobenthic (200–1,000 m).

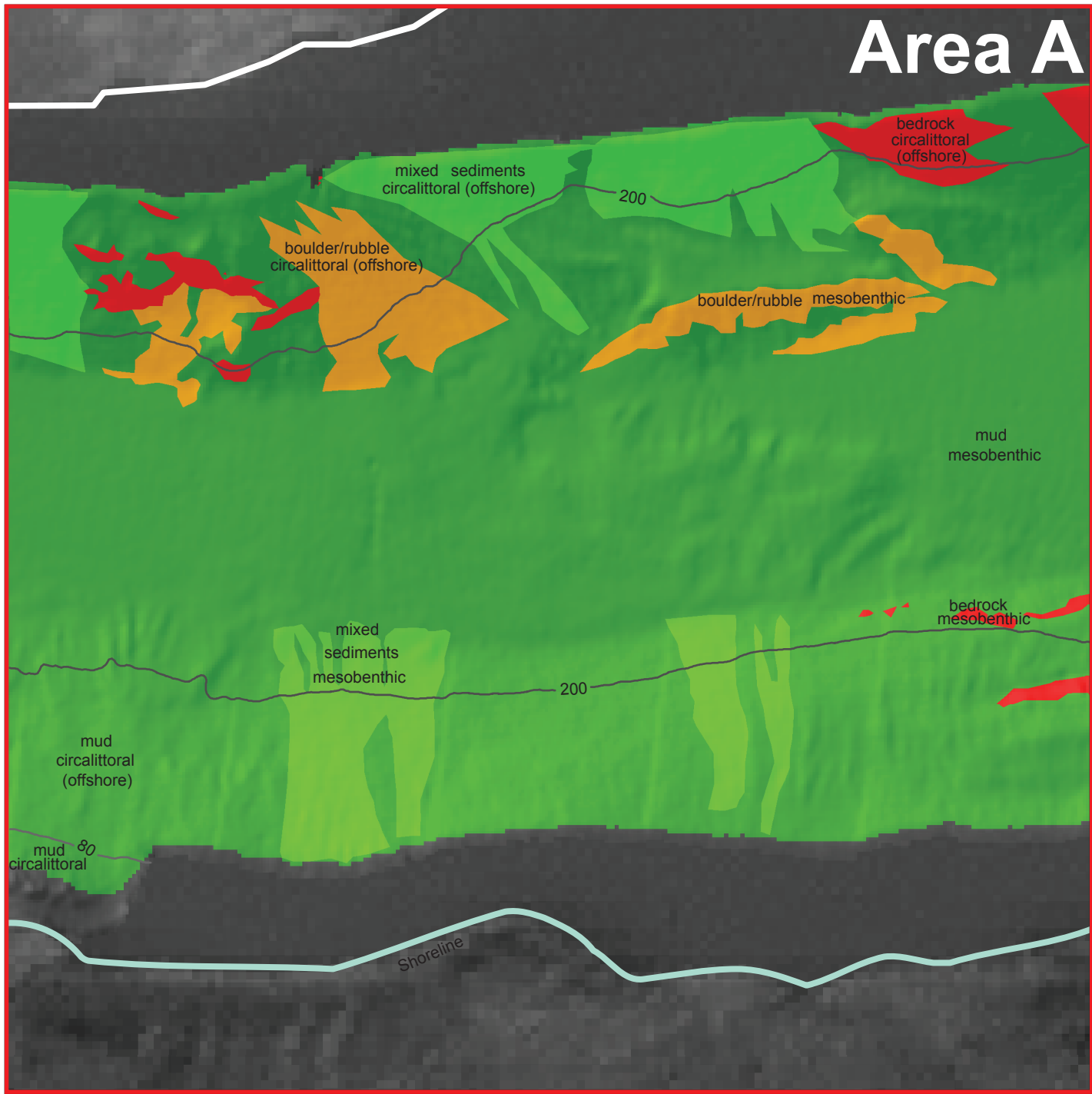
Mud is the dominant substrate for the measured area within Muir Inlet, comprising 89 percent or 66.79 km² with the greatest abundance in the mesobenthic depth zone (the fjord floor basins). Abundant glaciomarine mud in Muir Inlet is primarily currently derived from Muir and Riggs Glaciers. See the accompanying pamphlet for more information regarding sources and rates. Bedrock is the second most abundant substrate at 6.1 percent or 4.57 km², the greatest percentage is located in the circallittoral (offshore) depth zone (the fjord walls). Mixed sediments, where the exact composition of the sediment was unknown but there was a higher backscatter than that of mud, comprised 3.2 percent or 2.4 km² as was also primarily located in the circallittoral (offshore) depth zone. These mixed sediment areas commonly represent areas along the fjord walls where side-entry fluvial systems deposit coarser sediment. The boulder/rubble substrate class comprises 1.3 or 0.99 km² of the measured area in Muir Inlet. Cobble/gravel could only be confidently placed in 0.4 percent or 0.29 km², but likely makes up part of the mixed sediments class as well.

Table 1. Substrate distribution for Muir Inlet.

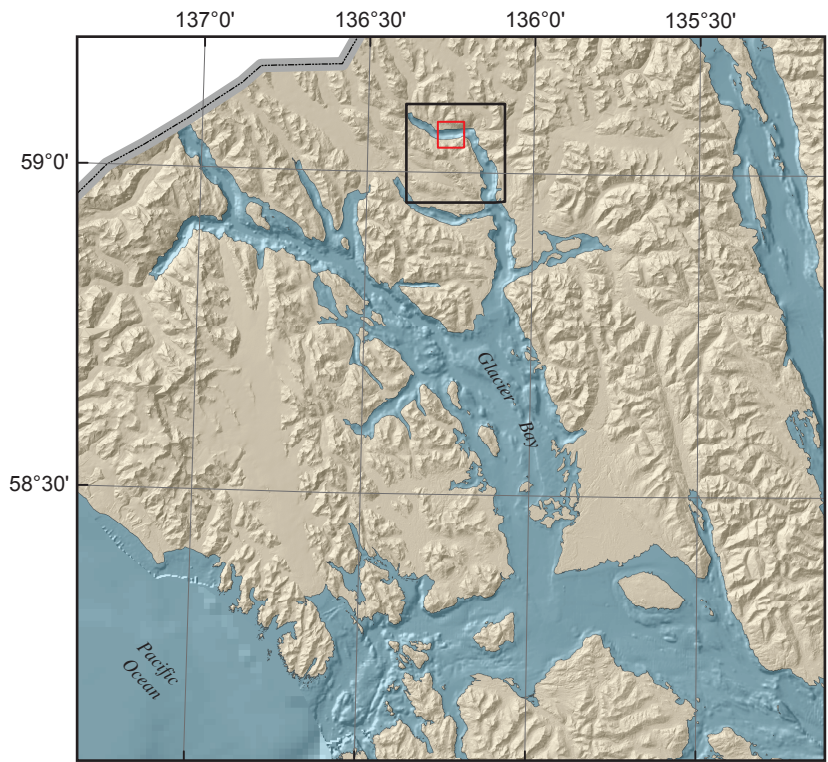
CMECS class	CMECS subclass	Percentage of total area	Area (km ²)
Unconsolidated bottom	mud	88.7	64.6
	mixed sediments	3.3	2.4
	cobble/gravel	0.4	0.3
Rock bottom	boulder/rubble	1.4	1.0
	bedrock	6.2	4.5

Table 2. Substrate distribution by depth zone for Muir Inlet.

CMECS subclass	Deep infralittoral: 5–30 m water depth		Circallittoral: 30–80 m water depth		Circallittoral (offshore): 80–200 m water depth		Mesobenthic: 200–1,000 m water depth	
	Percent	Area (km ²)	Percent	Area (km ²)	Percent	Area (km ²)	Percent	Area (km ²)
Mud	0.05	0.04	3.53	2.57	28.79	20.95	56.35	41.00
Mixed sediments	0	0	0.11	0.08	1.94	1.41	1.26	0.91
Cobble/gravel	0	0	0.03	0.02	0.34	0.25	0.03	0.02
Boulder/rubble	0	0	0.01	0.01	0.56	0.41	0.79	0.57
Bedrock	0.01	0.01	0.43	0.31	3.95	2.88	1.83	1.33

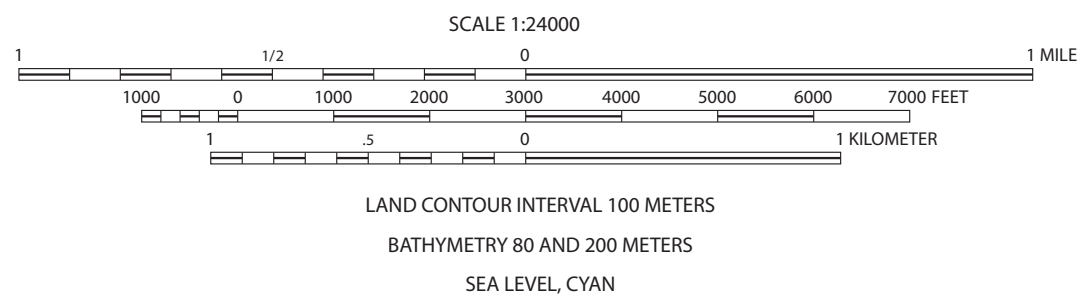
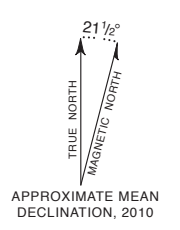


Inlarged area A shows a detailed view of the three benthic depth zones: circallittoral (30–80 m), circallittoral (offshore) (80–200 m), and mesobenthic (200–1,000 m). Four of the five classified substrates are depicted: mud (dark green), mixed sediments (light green), boulder/rubble (orange), and bedrock (red). Isobath in meters.



Location map showing upper Muir Inlet and Area A of map.

Base from U.S. Geological Survey National Elevation Dataset
NAD83 Landmark 7 imagery, 1999
Universal Transverse Mercator Zone 8N Projection, WGS84



Seafloor Geology mapped by Luke D. Trusel, 2008.
Based on multibeam sonar data collected in June 2004 under National Science Foundation award OCE03-41096.
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CMECS Substrate Map of Upper Muir Inlet, Glacier Bay National Park and Preserve, Alaska

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